



Rocky Flats Environmental Technology Site

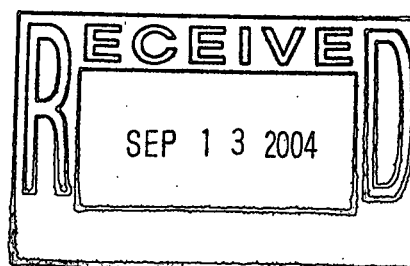
PRE-DEMOLITION SURVEY REPORT (PDSR)

BUILDING 903A CLOSURE PROJECT

REVISION 0

August 17, 2004

**CLASSIFICATION REVIEW NOT REQUIRED PER
EXEMPTION NUMBER CEX-005-02**



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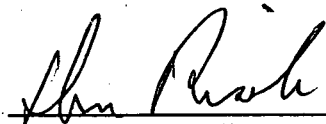
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REVISION 0

August 17, 2004

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ABBREVIATIONS/ACRONYMS

| | |
|---------------------|---|
| ACM | Asbestos Containing Material |
| Be | Beryllium |
| CDPHE | Colorado Department of Public Health and the Environment |
| DCGL _{EMC} | Derived Concentration Guideline Level – elevated measurement comparison |
| DCGL _W | Derived Concentration Guideline Level – Wilcoxon Rank Sum Test |
| D&D | Decontamination and Decommissioning |
| DDCP | Decontamination and Decommissioning Characterization Protocol |
| DOE | U.S. Department of Energy |
| DPP | Decommissioning Program Plan |
| DQA | Data quality assessment |
| DQOs | Data quality objectives |
| EPA | U.S. Environmental Protection Agency |
| FDPMP | Facility Disposition Program Manual |
| HVAC | Heating, ventilation, air conditioning |
| HSAR | Historical Site Assessment Report |
| HEUN | Highly Enriched Uranyl Nitrate |
| IHSS | Individual Hazardous Substance Site |
| IWCP | Integrated Work Control Package |
| K-H | Kaiser-Hill |
| LBP | Lead-based paint |
| LLW | Low-level waste |
| MARSSIM | Multi-Agency Radiation Survey and Site Investigation Manual |
| MDA | Minimum detectable activity |
| MDC | Minimum detectable concentration |
| NORM | Naturally occurring radioactive material |
| NRA | Non-Rad-Added Verification |
| OSHA | Occupational Safety and Health Administration |
| PARCC | Precision, accuracy, representativeness, comparability and completeness |
| PCBs | Polychlorinated Biphenyls |
| PDS | Pre-demolition survey |
| QC | Quality Control |
| RCRA | Resource Conservation and Recovery Act |
| RFCA | Rocky Flats Cleanup Agreement |
| RFETS | Rocky Flats Environmental Technology Site |
| RFFO | Rocky Flats Field Office |
| RLC | Reconnaissance Level Characterization |
| RLCR | Reconnaissance Level Characterization Report |
| RSA | Removable Surface Activity |
| RSP | Radiological Safety Practices |
| SVOCs | Semi-volatile organic compounds |
| TCLP | Toxicity Characteristic Leaching Procedure |
| TSA | Total surface activity |
| VOCs | Volatile organic compounds |

EXECUTIVE SUMMARY

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 903A. Because this Type 2 building will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Building surfaces characterized as part of this PDS included the floors, walls and ceiling. Environmental media beneath and surrounding the facility was not within the scope of this PDS and will be addressed in accordance with the Soil Disturbance Permit process and in compliance with RFCA.

The PDS encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

Results indicate that no radiological or chemical contamination exists in excess of the PDSP unrestricted release limits. Asbestos abatement was not required per Colorado Department of Public Health and Environment (CDPHE) Regulation 8. Beryllium sample results were below the investigative level of $0.1 \mu\text{g}/100\text{cm}^2$. In 2004, prior to PDS activities, RCRA Closure of Unit 18.01 was initiated in accordance with the Closure Plan For Interim Status Units At RFETS. Final analyses are pending to demonstrate RCRA Clean Closure of the concrete pad and sump. RCRA Unit 18.01 will be closed prior to demolition in accordance with the Closure Description Document For Partial Closure Of RCRA Interim Status Unit 18.01, DOE Letter 04-DOE-00081, dated March 11, 2004. Any potentially PCB-containing fluorescent light ballasts and hazardous waste items (e.g., mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury-containing gauges, circuit boards, leaded glass, and lead-acid batteries) were previously removed from the building and therefore, do not impact demolition activities.

Based upon the PDSR, Building 903A can be demolished and the waste managed as sanitary waste. To ensure that the facility remains free of contamination and PDS data remain valid, Level 2 isolation controls have been established and the area posted accordingly.

1 INTRODUCTION

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 903A. Because this Type 2 building will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Building surfaces characterized as a part of this PDS included floors, walls, ceilings and roof. Environmental media beneath and surrounding the facilities were not within the scope of this PDS and will be addressed in accordance with the Soil Disturbance Permit process and in compliance with RFCA.

An RLCR was not performed for this facility. Instead a RFCA Contact Record was written (*Building 903A and 903B Reconnaissance Level Characterization*, dated 6/30/04), that discusses the process history of the facility. Based on the process history, the facility was classified as a Type 2 RFCA facility and recorded as such in the Contact Record.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed, among these is Building 903A. The location of this facility is shown in Attachment A, Facility Location Map. This facility no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before this Type 2 facility can be demolished, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the PDS results for Building 903A. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS is built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report and Reconnaissance Level Characterization Report for Building 903A, dated April 23, 2003, Revision 0.

1.1 Purpose

The purpose of this report is to communicate and document the results of the Building 903A PDS effort. A PDS is performed prior to building demolition to define the final radiological and chemical conditions of a facility. Final conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the final radiological and chemical conditions of Building 903A. Environmental media beneath and surrounding the facilities are not within the scope of this PDSR and will be addressed in accordance with the Soil Disturbance Permit process and in compliance with RFCA.

1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this PDS were the same DQOs identified in the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

A Facility-specific Historical Site Assessment (HSA) was conducted to understand the facility history and related hazards. The HSA consisted of facility walkdowns, interviews, and document review, including review of the Historical Release Report. A RLCR was not performed for Building 903A – refer to RFCA Contact Record, DAP-024, dated June 30, 2004, for a discussion and approval for not performing the Building 903A RLCR. Based on the HSA and Contact Record, Building 903A was classified as a Type 2 Facility. The HSA results were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. HSA documentation is located in the RISS Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Building 903A was characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files for the Building 903A Radiological Characterization Plan). Individual radiological survey unit packages are maintained in the RISS Characterization Project files.

Radiological survey unit package 903A02 was developed for Building 903A in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachment B, Radiological Data Summary and Survey Maps.

Building 903A was classified as a MARSSIM Class 2 Survey Unit because this building was not expected to contain residual radioactivity greater than the DCGL_w, but had a potential for low levels of contamination. A total of 44 TSA measurements (31 systematically grid, 10 biased and 3 QC) and 41 RSA measurements (31 systematically grid and 10 biased) were taken and scan surveys performed. Alpha scan surveys of 100% of the floor (216 m² minimum) and 25% of the remaining accessible surfaces (474 m² minimum) at biased locations were performed. None of the measurements or scans indicated elevated activity above applicable transuranic DCGL values. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachment B, *Radiological Data Summary and Survey Maps*.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Building 903A was characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on, or in the facility. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan was developed during the planning phase that describes sampling requirements and the justification for the sample locations and estimated sample numbers. The contaminants of concern were asbestos and beryllium. Refer to Attachment C, Chemical Summary Data and Sample Maps, for details on sample results and sample locations. Isolation control postings are displayed on affected structures to ensure no hazardous materials are introduced.

4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted in Building 903A during the PDS. A CDPHE-certified asbestos inspector conducted the inspections, and suspect materials were identified for sampling at the discretion of the inspector. No suspect materials were identified, therefore no asbestos sampling was required or performed as part of the PDS.

4.2 Beryllium (Be)

Six (6) biased beryllium smear samples were collected on the interior and exterior surfaces of Building 903A in accordance with the PDSP and the *Beryllium Characterization Procedure*, PRO-536-BCPR, Revision 0, September 9, 1999. All beryllium PDS smear sample results for Building 903A were less than the investigative limit of 0.1 µg/100cm². PDS beryllium laboratory sample data and location maps are contained in Attachment C, *Beryllium Data Summaries and Sample Maps*.

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based on the HSAR, facility walk-downs and a review of RFETS waste management databases, Building 903A functioned as an equipment decontamination facility since it was constructed in 1993. The decontamination facility was also known as RCRA Unit 18.01, the Remedial Action Decontamination Pad (RADP). In 1996, partial closure of this unit was completed in accordance with "debris rule" decontamination. In 2004, prior to PDS activities, RCRA Closure of Unit 18.01 was initiated in accordance with the Closure Plan For Interim Status Units At RFETS. Final analyses are pending to demonstrate RCRA Clean Closure of the concrete pad and sump. On this basis, sampling was not performed as part of this PDS. However, RCRA Unit 18.01 will be closed prior to demolition in accordance with the Closure Description Document For Partial Closure Of RCRA Interim Status Unit 18.01, DOE Letter 04-DOE-00081, dated March 11, 2004.

Painted surfaces were not sampled for lead. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified High Contamination Areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal. There were no High Contamination Areas associated with Building 964.

The building may have contained some RCRA regulated items, such as mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury containing gauges, circuit boards, and lead-acid batteries. These items have been removed and managed in accordance with the Colorado Hazardous Waste Act. Additionally, the curtains from the RADP were characterized and managed as RCRA hazardous based on analyses performed on similar curtains at the B966 Decontamination Pad.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSAR, interviews, facility walkdowns and a review of historical WSRIC processes, PCBs were not introduced into the facility, therefore, sampling for PCBs was not conducted as part of this PDS.

Based on the age of Building 903A, paints used on the facility did not contain PCBs; and therefore, painted surfaces will not be managed as PCB Bulk Product Waste. Painted concrete surfaces can be used as backfill on site in accordance with approval received from EPA in November 2001 (letter from K. Clough, US EPA Region 8, to J. Legare, DOE RFFO, 8EPR-F, Approval of the Risk-Based Approach for Polychlorinated Biphenyls (PCB)-Based Painted Concrete), provided the concrete meets the unrestricted-release criteria outlined in the Concrete Recycling RSOP.

5 PHYSICAL HAZARDS

Physical hazards associated with Building 903A consists of those common to standard industrial environments, and include hazards associated with energized systems, utilities, and trips and falls. There are no other unique hazards associated with the facility. The facility has been relatively well maintained and is in good physical condition, and therefore, does not present hazards associated with building deterioration. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Building 903A, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments B and C) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ◆ the *number* of samples and surveys;
- ◆ the *types* of samples and surveys;
- ◆ the sampling/survey process as implemented "in the field"; and
- ◆ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment D.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of Building 903A will generate sanitary waste. Estimated waste volumes are presented below. PCB ballast and hazardous waste items have been removed and managed pursuant to Site PCB and waste management procedures.

| WASTE TYPES AND VOLUME ESTIMATES | | | | | | | |
|----------------------------------|---------------------|-----------------|------------------|--------------------------------------|--------------------------|----------------|---------------------------|
| Facility | Concrete (cu ft) | Wood (cu ft) | Metal (cu ft) | Corrugated Sheet Metal (cu ft) | Wall Board (cu ft) | ACM (cu ft) | Other Waste (cu ft) |
| 903A | 800 | 200 | 800 | 500 | 0 | 0 | None |

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the PDS analysis of radiological, chemical and physical hazards, Building 903A meets PDSP unrestricted release criteria. RCRA Closure of Unit 18.01 was initiated in accordance with the Closure Plan For Interim Status Units At RFETS. Final analyses are pending to demonstrate RCRA Clean Closure of the concrete pad and sump. RCRA Unit 18.01 will be closed prior to demolition in accordance with the Closure Description Document For Partial Closure Of RCRA Interim Status Unit 18.01, DOE Letter 04-DOE-00081, dated March 11, 2004. PCB ballast and hazardous waste items have been removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations.

The PDS for Building 903A was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. Environmental media beneath and surrounding the facilities will be addressed at a future date in accordance with the Soil Disturbance Permit process and in compliance with RFCA. To ensure that Building 903A remains free of contamination and PDS data remain valid, Level 2 Isolation Controls have been established and the facility posted accordingly.

9 REFERENCES

- DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA)*, July 19, 1996.
- DOE Order 5400.5, *Radiation Protection of the Public and the Environment*
- DOE Order 414.1A, *Quality Assurance*
- EPA, 1994. *The Data Quality Objective Process*, EPA QA/G-4.
- K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.
- MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.
- MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.
- MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.
- MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.
- MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual* (NUREG-1575, EPA 402-R-97-016).
- PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.
- PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.
- PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.
- PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-563-ACPR, *Asbestos Characterization Procedure*, Revision 0, August 24, 1999.
- PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.
- RFETS, *Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*.
- RFETS, *Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal*.
- RFETS, *RFCA RSOP for Recycling Concrete*, September 28, 1999
- Historical Site Assessment Report for the Area 5 – Group 14 Facilities*, dated December 2002, Revision 0.
- RFCA Contact Record, *Building 903A and 903B Reconnaissance Level Characterization*, dated 6/30/04.
- Closure Description Document For Partial Closure Of RCRA Interim Status Unit 18.01*, DOE Letter 04-DOE-00081, Dated March 11, 2004.

ATTACHMENT A

Facility Location Map

903A Location Map

Map Features

- Buildings**
D&D Facility
Paved Roads
Dirt Roads
Lakes
Streams
Railroad Removed
Railroad Remaining
Fence Removed
Fence Remaining



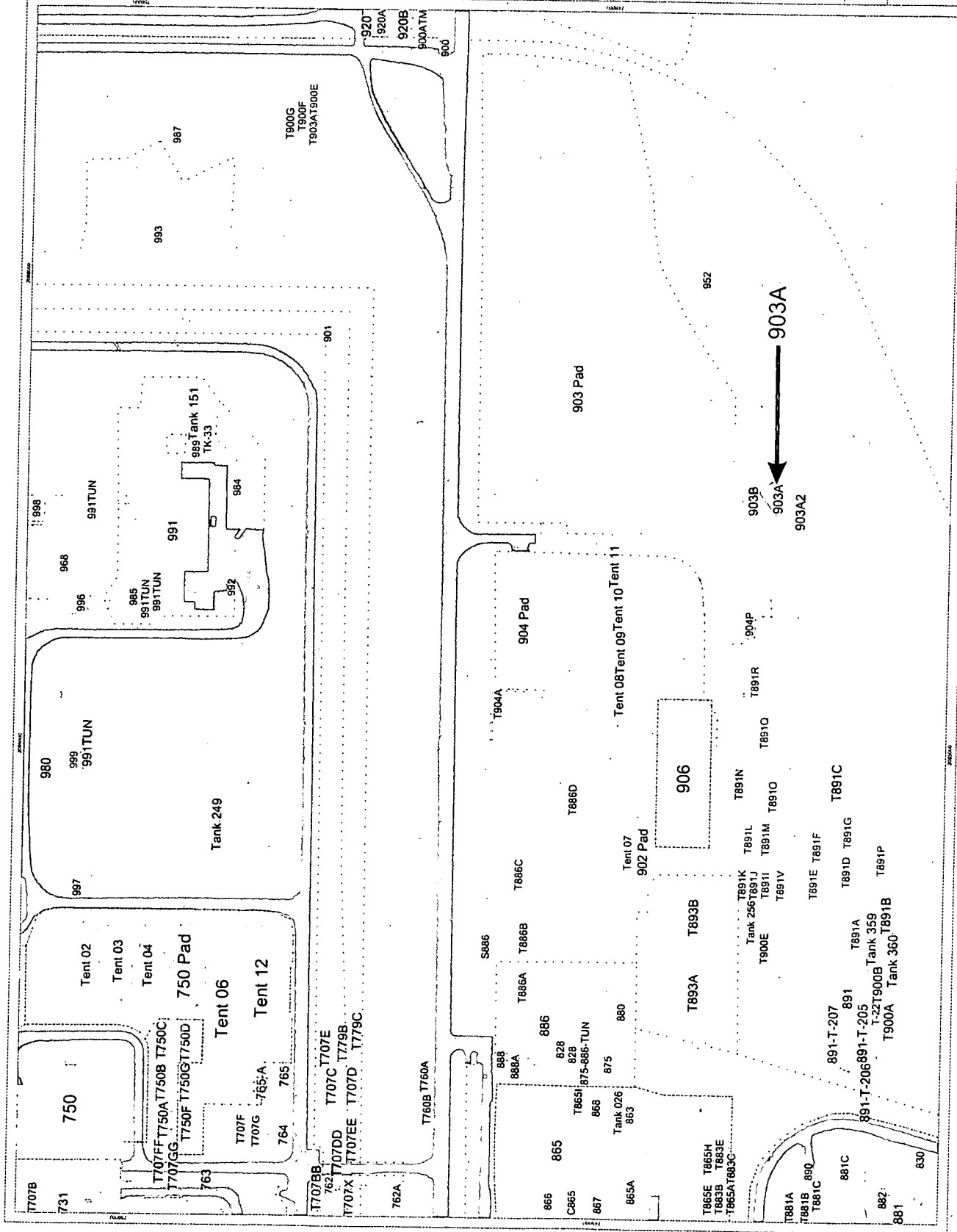
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State Plane Coordinate Projection
Colorado Central Zone (347G)

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. (303) 966-7707

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ATTACHMENT B

Radiological Data Summaries and Survey Maps

Survey Area: 5**Survey Unit:** 903A02**Building:** 903A**Description:** Building 903A Decon Pad (Interior and Exterior)

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr QC Required: 2

Nbr Random Measurements Performed: 31

Nbr Biased Measurements Performed: 10

Nbr QC Performed: 3

Alpha

| | |
|-----------------------------------|------------------------------|
| Maximum: | 72.8 dpm/100cm ² |
| Minimum: | -7.1 dpm/100cm ² |
| Mean: | 23.4 dpm/100cm ² |
| Standard Deviation: | 20.1 |
| QC Maximum: | 39.0 dpm/100cm ² |
| QC Minimum: | 16.3 dpm/100cm ² |
| QC Mean: | 31.1 dpm/100cm ² |
| Transuranic DCGL _W : | 100.0 dpm/100cm ² |
| Transuranic DCGL _{EMC} : | 300.0 dpm/100cm ² |

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 31

Nbr Biased Measurements Performed: 10

Alpha

| | |
|---------------------------------|-----------------------------|
| Maximum: | 2.9 dpm/100cm ² |
| Minimum: | -1.2 dpm/100cm ² |
| Mean: | -0.3 dpm/100cm ² |
| Standard Deviation: | 1.1 |
| Transuranic DCGL _W : | 20.0 dpm/100cm ² |

Media Sample Results

Nbr Random Required: 0

Nbr Biased Required: 0

Nbr Random Collected: 0

Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: 5

Survey Unit: 903A02

Building: 903A

Description: Building 903A Decon Pad (Interior and Exterior)

Instrument Data Sheet

| Inst/RCT Number | RCT ID | Analysis Date | Instr Model | Instru S/N | Probe Type | Calibration Due Dt | Instru Efficiency | | A-Priori MDA (dpm/100cm ²) | | Survey Type |
|--------------------|-----------|------------------|----------------|---------------|---------------|-----------------------|-------------------|------|---|------|----------------|
| | | | | | | | Alpha | Beta | Alpha | Beta | |
| 1 | 712193 | 08/05/04 | Electra | 290 | DP-6 | 09/16/04 | 0.210 | NA | 48.0 | NA | T/S |
| 2 | 702575 | 08/05/04 | Electra | 672 | DP-8 | 01/12/05 | 0.162 | NA | 48.0 | NA | S |
| 3 | 712193 | 08/05/04 | Ludlum 292 | 99042 | NA | 10/26/04 | 0.349 | NA | 10.0 | NA | R |
| 4 | 702575 | 08/09/04 | Electra | 297 | DP-6 | 01/27/04 | 0.219 | NA | 48.0 | NA | T/S |
| 5 | 712467 | 08/09/04 | Electra | 3109 | DP-6 | 12/14/04 | 0.222 | NA | 48.0 | NA | T |
| 6 | 712193 | 08/09/04 | Electra | 290 | DP-6 | 09/16/04 | 0.210 | NA | 48.0 | NA | Q/S |
| 7 | 711447 | 08/09/04 | Ludlum 292 | 99042 | NA | 10/26/04 | 0.349 | NA | 10.0 | NA | R |
| 8 | 702575 | 08/12/04 | Electra | 1271 | DP-6 | 01/01/05 | 0.227 | NA | 48.0 | NA | T/S |
| 9 | 702575 | 08/12/04 | Ludlum 292 | 99042 | NA | 10/26/04 | 0.349 | NA | 10.0 | NA | R |
| 10 | 712193 | 08/12/04 | Electra | 1512 | DP-6 | 11/10/04 | 0.219 | NA | 48.0 | NA | Q |

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: 5

Survey Unit: 903A02

Building: 903A

Description: Building 903A Decon Pad (Interior and Exterior)

Random Removable Surface Activity Data Sheet

| Random Measurement Location | Inst / RCT Nbr | Net Alpha (dpm/100cm ²) | Net Beta (dpm/100cm ²) | |
|-----------------------------|----------------|-------------------------------------|------------------------------------|--|
| 903A02PRP-N001 | 7 | -1.2 | N/A | |
| 903A02PRP-N002 | 7 | -1.2 | N/A | |
| 903A02PRP-N003 | 7 | 0.3 | N/A | |
| 903A02PRP-N004 | 7 | -1.2 | N/A | |
| 903A02PRP-N005 | 7 | 0.3 | N/A | |
| 903A02PRP-N006 | 7 | -1.2 | N/A | |
| 903A02PRP-N007 | 7 | -1.2 | N/A | |
| 903A02PRP-N008 | 7 | -1.2 | N/A | |
| 903A02PRP-N009 | 7 | -1.2 | N/A | |
| 903A02PRP-N010 | 7 | -1.2 | N/A | |
| 903A02PRP-N011 | 7 | -1.2 | N/A | |
| 903A02PRP-N012 | 7 | -1.2 | N/A | |
| 903A02PRP-N013 | 7 | -1.2 | N/A | |
| 903A02PRP-N014 | 7 | -1.2 | N/A | |
| 903A02PRP-N015 | 7 | 0.3 | N/A | |
| 903A02PRP-N016 | 7 | 0.3 | N/A | |
| 903A02PRP-N017 | 7 | -1.2 | N/A | |
| 903A02PRP-N018 | 7 | -1.2 | N/A | |
| 903A02PRP-N019 | 7 | -1.2 | N/A | |
| 903A02PRP-N020 | 7 | -1.2 | N/A | |
| 903A02PRP-N021 | 7 | -1.2 | N/A | |
| 903A02PRP-N022 | 7 | 0.3 | N/A | |
| 903A02PRP-N023 | 7 | -1.2 | N/A | |
| 903A02PRP-N034 | 9 | 2.0 | N/A | |
| 903A02PRP-N035 | 9 | 0.5 | N/A | |
| 903A02PRP-N036 | 9 | -0.9 | N/A | |
| 903A02PRP-N037 | 9 | -0.9 | N/A | |
| 903A02PRP-N038 | 9 | -0.9 | N/A | |
| 903A02PRP-N039 | 9 | 0.5 | N/A | |

Survey Area: 5

Survey Unit: 903A02

Building: 903A

Description: Building 903A Decon Pad (Interior and Exterior)

Random Removable Surface Activity Data Sheet

| Random Measurement Location | Inst / RCT Nbr | Net Alpha (dpm/100cm ²) | Net Beta (dpm/100cm ²) | |
|-----------------------------|----------------|-------------------------------------|------------------------------------|--|
| 903A02PRP-N040 | 9 | 0.5 | N/A | |
| 903A02PRP-N041 | 9 | 0.5 | N/A | |

Biased Removable Surface Activity Data Sheet

| Biased Measurement Location | Inst / RCT Nbr | Net Alpha (dpm/100cm ²) | Net Beta (dpm/100cm ²) | |
|-----------------------------|----------------|-------------------------------------|------------------------------------|--|
| 903A02PBP-N024 | 3 | 1.4 | N/A | |
| 903A02PBP-N025 | 3 | 2.9 | N/A | |
| 903A02PBP-N026 | 3 | 1.4 | N/A | |
| 903A02PBP-N027 | 7 | -1.2 | N/A | |
| 903A02PBP-N028 | 7 | 0.3 | N/A | |
| 903A02PBP-N029 | 7 | 0.3 | N/A | |
| 903A02PBP-N030 | 7 | 1.8 | N/A | |
| 903A02PBP-N031 | 7 | -1.2 | N/A | |
| 903A02PBP-N032 | 7 | -1.2 | N/A | |
| 903A02PBP-N033 | 7 | 0.3 | N/A | |

Comments:

Survey Area: 5

Survey Unit: 903A02

Building: 903A

Description: Building 903A Decon Pad (Interior and Exterior)

Random/QC Total Surface Activity Data Sheet

| Random Measurement Location | Inst / RCT Nbr | Net Alpha (dpm/100cm ²) | Net Beta (dpm/100cm ²) | |
|-----------------------------|----------------|-------------------------------------|------------------------------------|--|
| 903A02QRP-N001 | 6 | 38.2 | N/A | |
| 903A02PRP-N001 | 10 | 29.6 | N/A | |
| 903A02PRP-N002 | 4 | 26.4 | N/A | |
| 903A02PRP-N003 | 4 | 11.3 | N/A | |
| 903A02PRP-N004 | 4 | 14.5 | N/A | |
| 903A02PRP-N005 | 5 | 41.1 | N/A | |
| 903A02PRP-N006 | 4 | 2.2 | N/A | |
| 903A02PRP-N007 | 4 | 11.3 | N/A | |
| 903A02PRP-N008 | 4 | 23.6 | N/A | |
| 903A02PRP-N009 | 4 | 8.1 | N/A | |
| 903A02PRP-N010 | 5 | 19.9 | N/A | |
| 903A02PRP-N011 | 4 | 20.4 | N/A | |
| 903A02QRP-N011 | 6 | 16.3 | N/A | |
| 903A02PRP-N012 | 5 | 14.1 | N/A | |
| 903A02PRP-N013 | 4 | 8.1 | N/A | |
| 903A02PRP-N014 | 5 | 14.1 | N/A | |
| 903A02PRP-N015 | 5 | 32.1 | N/A | |
| 903A02PRP-N016 | 5 | -2.6 | N/A | |
| 903A02PRP-N017 | 5 | 5.1 | N/A | |
| 903A02PRP-N018 | 5 | -7.1 | N/A | |
| 903A02PRP-N019 | 5 | 16.8 | N/A | |
| 903A02PRP-N020 | 5 | 10.9 | N/A | |
| 903A02PRP-N021 | 5 | -3.9 | N/A | |
| 903A02PRP-N022 | 5 | 10.9 | N/A | |
| 903A02PRP-N023 | 5 | 7.8 | N/A | |
| 903A02PRP-N034 | 8 | 10.3 | N/A | |
| 903A02PRP-N035 | 8 | 46.9 | N/A | |

Survey Area: 5

Survey Unit: 903A02

Building: 903A

Description: Building 903A Decon Pad (Interior and Exterior)

Random/QC Total Surface Activity Data Sheet

| Random Measurement Location | Inst / RCT Nbr | Net Alpha (dpm/100cm ²) | Net Beta (dpm/100cm ²) | |
|-----------------------------|----------------|-------------------------------------|------------------------------------|--|
| 903A02QRP-N035 | 10 | 39.0 | N/A | |
| 903A02PRP-N036 | 8 | 39.8 | N/A | |
| 903A02PRP-N037 | 8 | 14.7 | N/A | |
| 903A02PRP-N038 | 8 | 16.1 | N/A | |
| 903A02PRP-N039 | 8 | 22.2 | N/A | |
| 903A02PRP-N040 | 8 | 38.1 | N/A | |
| 903A02PRP-N041 | 8 | 23.5 | N/A | |

Biased Total Surface Activity Data Sheet

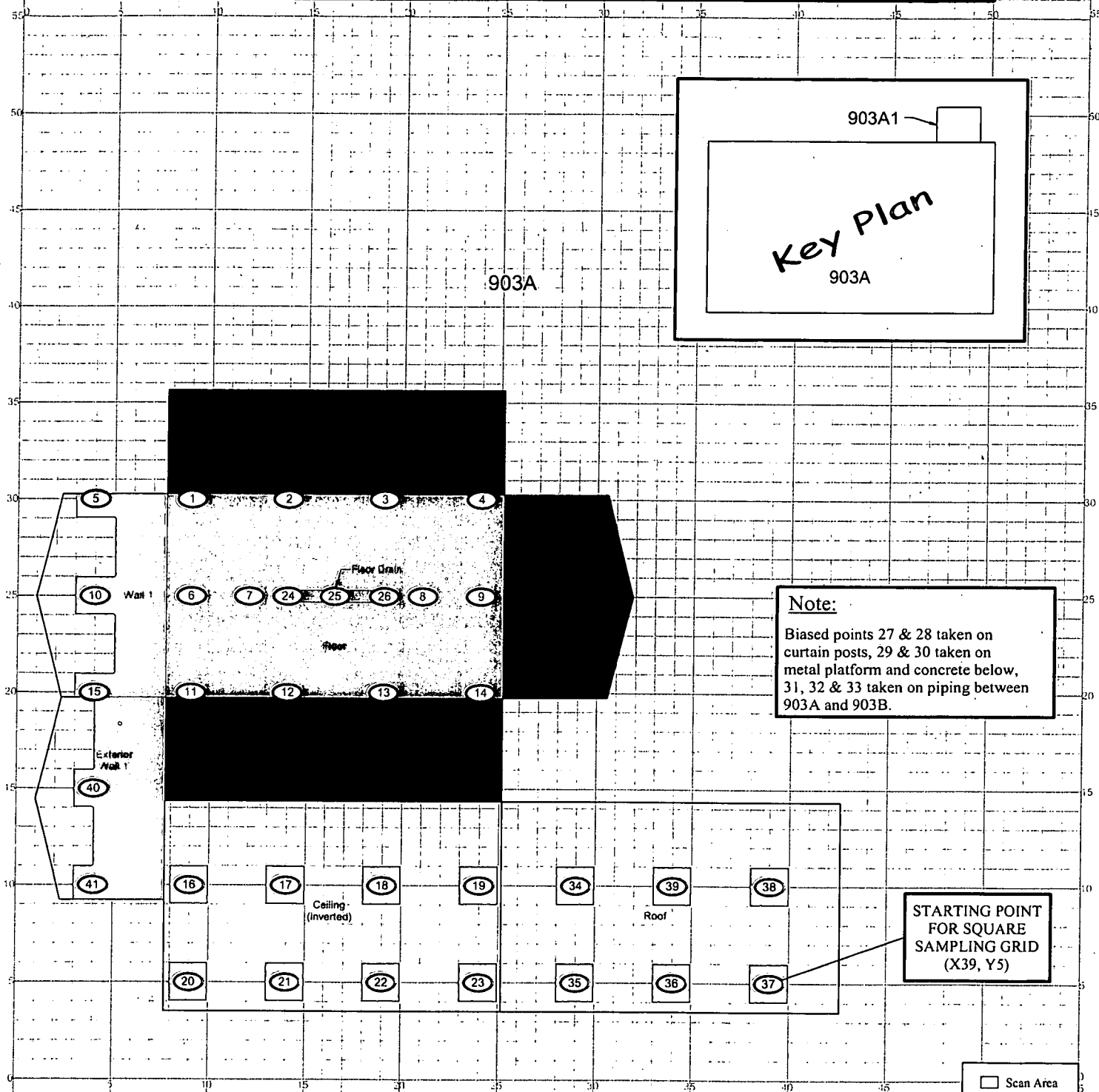
| Biased Measurement Location | Inst / RCT Nbr | Net Alpha (dpm/100cm ²) | Net Beta (dpm/100cm ²) | |
|-----------------------------|----------------|-------------------------------------|------------------------------------|--|
| 903A02PBP-N024 | 1 | 72.8 | N/A | |
| 903A02PBP-N025 | 1 | 3.3 | N/A | |
| 903A02PBP-N026 | 1 | 19.0 | N/A | |
| 903A02PBP-N027 | 4 | 46.2 | N/A | |
| 903A02PBP-N028 | 4 | 3.7 | N/A | |
| 903A02PBP-N029 | 4 | 59.9 | N/A | |
| 903A02PBP-N030 | 4 | 48.0 | N/A | |
| 903A02PBP-N031 | 4 | 61.7 | N/A | |
| 903A02PBP-N032 | 4 | 59.9 | N/A | |
| 903A02PBP-N033 | 4 | 57.2 | N/A | |

Comments: Biased points 24, 25, & 26 taken in floor trench, 27 & 28 taken on curtain posts, 29 & 30 taken on metal platform and concrete below, 31, 32 & 33 taken on piping between 903A and 903B.

PRE-DEMOLITION SURVEY FOR B903A

Survey Area: 5 Survey Unit: 903A02 Classification: 2
 Building: 903A
 Survey Unit Description: Building 903A Interior & Exterior
 Total Area: 682 sq. m. Total Floor Area: 183 sq. m.
 Grid Spacing for Survey Points: 5m. X 5m.

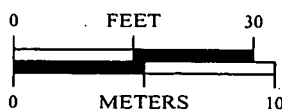
PAGE 1 OF 1



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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Scan Survey Information
 Survey Instrument ID #(s) & RCT ID #(s):
 1, 2, 4, 6, 8

1 inch = 24 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-986-7707

Prepared for:



CH2MHILL
 Communications Group



MAP ID: 03-0201/903A02-SC

Aug. 11, 2004

Scan Area

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ATTACHMENT C

Chemical Data Summaries and Sample Maps

Beryllium Data Summary

| Sample Number | Map Survey | Room | Sample Location | Result ($\mu\text{g}/100\text{ cm}^2$) |
|----------------------------|------------|----------|--|---|
| Building 903A - RIN04Z2377 | | | | |
| 903A-08052004-9-001 | 1 | 1 - Slab | Northwest corner of concrete slab floor | < 0.1 |
| 903A-08052004-9-002 | 2 | 1 - Slab | Center of concrete slab, N side of pit | < 0.1 |
| 903A-08052004-9-003 | 3 | 1 - Slab | Lip of pit, in center of concrete slab | < 0.1 |
| 903A-08052004-9-004 | 4 | 1 - Slab | Northeast corner of concrete slab floor | < 0.1 |
| 903A-08052004-9-005 | 5 | 1 - Slab | South side, near middle of concrete slab | < 0.1 |
| 903A-08052004-9-006 | 6 | 1 - Slab | Floor of concrete pit, near west end | < 0.1 |

CHEMICAL SAMPLE MAP

Building 903A
Beryllium

PAGE 1 OF 1

903A Interior

903A1
Key Plan
903A

Wall 1

Floor Drain

Floor

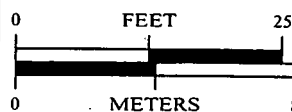
Ceiling
(Inverted)

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location

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- Open/Inaccessible Area
- Area in Another Survey Unit



1 inch = 18 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

Prepared for:



CH2MHILL
Communications Group



MAP ID: 03-02011903A02-BE

Aug. 09, 2004

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ATTACHMENT D

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION (V&V) OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed. The radiological survey assessment is provided in Table D-1 and beryllium in Table D-2. A data completeness summary for all results is given in Table D-3.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project File. The report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for Building 903A based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic DCGL_w (100 dpm/100cm²) and the Uranium DCGL_w (5,000 dpm/100cm²) unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design for each survey unit performed per PDS requirements was optimized by checking actual measurement results acquired during pre-demolition surveys against the model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

DQA SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled yielded results less than their associated action levels and with acceptable certainties.

Based upon an independent review of the radiological data, it is determined that the original project DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable DCGL unrestricted release levels confirming Type 2 facility classification. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable RSPs, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits. All results meet the PDS unrestricted release criteria.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the facilities. On this basis, Building 903A meets the unrestricted release criteria with the confidences stated herein.

Table D-1 V&V of Radiological Results for Building 903A

| V&V CRITERIA, RADIOLGICAL SURVEYS | | K-H RSP 16.00 Series MARSSIM (NUREG-1575) | | |
|-----------------------------------|--|---|---------------|---|
| QUALITY REQUIREMENTS | | | | |
| Parameters | | Measure | Frequency | COMMENTS |
| ACCURACY | Initial calibrations | 90%<x<110% | ≥1 | Multi-point calibration through the measurement range encountered in the field; programmatic records. |
| | Daily source checks | 80%<x<120% | ≥1/day | Performed daily/within range. |
| | Local area background: Field | typically < 10 dpm | ≥1/day | All local area backgrounds were within expected ranges (i.e., no elevated anomalies.) |
| PRECISION | Field duplicate measurements for TSA | ≥5% of real survey points | ≥10% of reals | N/A |
| REPRESENTATIVENESS | MARSSIM methodology: Survey Unit 903A02 (interior and exterior). | statistical and biased | NA | Random w/ statistical confidence. |
| | Survey Maps | NA | NA | Random and biased measurement locations controlled/mapped to ±1m. |
| | Controlling Documents (Characterization Pkg; RSPs) | qualitative | NA | Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats. |
| COMPARABILITY | Units of measure | dpm/100cm ² | NA | Use of standardized engineering units in the reporting of measurement results. |
| COMPLETENESS | Plan vs. Actual surveys | >95% | NA | See Table D-3 for details. |
| | Usable results vs. unusable | >95% | | |
| SENSITIVITY | Detection limits | TSA: ≤50 dpm/100cm ² RA: ≤10 dpm/100cm ² | all measures | PDS MDAs ≤ 50% DCGL _w |

Table D-2 V&V of Beryllium Results for Building 903A

| V&V CRITERIA, CHEMICAL ANALYSES | | DATA PACKAGE | | COMMENTS |
|---------------------------------|---|---------------------------------------|-----------------------------------|---|
| BERYLLIUM | Prep: NMAM 7300 METHOD: OSHA ID-125G | LAB ----> | Johns Manville, Littleton, Co. | |
| | | RIN ----> | RIN04Z2377 | |
| QUALITY REQUIREMENTS | | Measure | Frequency | No qualifications significant enough to change project decisions. All results were below associated action levels and investigative levels. |
| ACCURACY | Calibrations Initial | linear calibration | ≥1 | |
| | Continuing | 80%<%R<120% | ≥1 | |
| | LCS/MS | 80%<%R<120% | ≥1 | |
| | Blanks – lab & field | <MDL | ≥1 | |
| | Interference check std (ICP) | NA | NA | |
| PRECISION | LCSD | 80%<%R<120% (RPD<20%) | ≥1 | |
| | Field duplicate | all results < RL | ≥1 | |
| REPRESENTATIVENESS | COC | Qualitative | NA | |
| | Hold times/preservation | Qualitative | NA | |
| | Controlling Documents (Plans, Procedures, maps, etc.) | Qualitative | NA | |
| COMPARABILITY | Measurement units | ug/100cm ² | NA | |
| COMPLETENESS | Plan vs. Actual samples | >95% | NA | |
| | Usable results vs. unusable | >95% | NA | |
| SENSITIVITY | Detection limits | MDL of 0.012 ug/100cm ² | all measures | |

Table D-3 Data Completeness Summary For Building 903A

| ANALYTE | Building/Area/ Unit | Sample Number Planned (Real & QC) | Sample Number Taken (Real & QC) | Project Decisions (Conclusions) & Uncertainty | Comments (RIN; Analytical Method, Qualifications, etc.) |
|--------------|---|--|---|--|--|
| Beryllium | Building 903A (interior) | 5 biased | 6 biased | No contamination found at any location | 10CFR850; OSHA ID-125G RIN04Z2377 No results above the action level (0.2 ug/100cm ²) or investigative level (0.1 ug/100cm ²). |
| Radiological | Survey Area 5 Survey Unit: 903A02 Bldg. 903A Decontamination Pad (interior and exterior) | 41 α TSA (31 systematic/ 10 biased) 41 α Smears (31 systematic/ 10 biased) 3 QC TSA 100% scan of floors and 25% scan of the remaining accessible surfaces | 41 α TSA (31 systematic/ 10 biased) 41 α Smears (31 systematic/ 10 biased) 3 QC TSA 100% scan of floors and 25% scan of the remaining accessible surfaces | No contamination at any location; all values below unrestricted release levels | Transuranic DCGLs used. |